

only has been recorded at Yuma during 1903, and Palmer visited an island in the gulf in 1889 which had had no rain for a year and a half. Landings were made at three points, the farthest at San Felipe Bay, 55 miles below the river. Mr. Brandegee visited San Luis Bay once, but the San Felipe region was entirely unexplored by botanists. Here the coast rises by gradual slope to 500 feet and then by precipitous rocks to peaks, one of which is over 10,000 feet high. The seasons are evidently irregular and not clearly marked. Many of the plants have milky or resinous juice and many are aromatic. *Cereus Schottii* was found forming dense groves near San Felipe. Living plants of what is probably *Cereus Pecten-aboriginum* were brought home. The Indian-comb cactus has a short trunk and long branches in contrast to the usual form of *C. giganteus*.

Although the plants are very sparse it is not to be supposed that they have a harder struggle for existence than others, as is shown by trying to grow them under artificial conditions. *Fouquieria splendens* seems to reach its optimum development in the delta lands. Cactuses with sheathing spines were noted and some of these shed their spines. The flora is not Arizonian. In San Felipe there are no plants with storage organs for there is no surplus of water to store.

In the discussion it was mentioned that the poison cacti are all unarmed.

Professor Underwood remarked on a specimen of the southern brake sent from Burlington, Vermont. This form, described in recent years as *Pteris aquilina* var. *pseudocaudata* by Clute, is the *Pteris latiuscula* Desv., described in 1827.

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REVIEWS

Bailey's Plant Breeding.*

Professor Bailey is a teacher in a rare sense and American botany owes much to his abundant, skilful and simple exposition

* Bailey, L. H. Plant Breeding. 12mo. Pp. 13 + 334. New York, The Macmillan Co. 1904. [Ed. 3.]

of the evolution theory as applied to the amelioration of plants.

In the book which we have before us the author discusses "The Fact and Philosophy of Variation," "The Philosophy of the Crossing of Plants, considered in Reference to their Improvement under Cultivation," "How Domestic Varieties Originate," and recent opinions, and the investigations of de Vries, Mendel and others. De Vries, himself, contributes a part of the last mentioned chapter, namely, that "On Hybridization," and Mr. Spillman, who has studied extensively the wheat varieties with especial reference to 'mendelism,' gives an account of his experiments which led him to independent results parallel to those of Mendel. Among the illustrations a photograph of the "cage" used by Professor de Vries in his experimental work at Amsterdam helps to bring the reader into a more living touch with this renowned investigator. The final chapter deals with the practical operation of pollination. The book is made necessary to every investigator of these problems, and useful to teachers and others interested, by a very full bibliography of chiefly horticultural writings.

The book is to be particularly recommended as a companion volume to "The Survival of the Unlike" for educational use. Although Professor Bailey confessedly takes a conservative attitude he is eminently fair minded, and states all the aspects of a question dispassionately. His attitude also toward the practical problem of horticulture is clearly and uncompromisingly scientific. The more we know about the behavior of plants, and the closer we follow the indications of nature, the more successful will our efforts be to ameliorate plants. The principle of the scientific method is thus adhered to. In a word, the treatment is such as to make it exemplary for students and teachers, and it should not only be found on every reference shelf from the high school to the university, but at least some portions of it should be required to be studied, as part of general education. This would help to make the public more intelligent as to the great importance of the phase of governmental effort dealing with the improvement of crops.

F. E. LLOYD.